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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,649	02/24/2005	Werner Kuhlmann	10808/217	8466

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EXAMINER	
BOOSALIS, FANI POLYZOS	

ART UNIT	PAPER NUMBER
2884	

DATE MAILED: 11/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

NC

Office Action Summary	Application No.	Applicant(s)	
	10/525,649	KUHLMANN, WERNER	
	Examiner	Art Unit	
	Faye Boosalis	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 13-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 13-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/24/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 9-11, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 9-11, and 18, the method is unclear and indefinite by not disclosing method of separating the auxiliary substrate with the auxiliary substrate not being separated and therefore no further search has been performed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 5-7 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Henry et al (US 4,940,901) in view of Turnbull et al (US 5,122,666).*

Regarding claim 1, Henry discloses a sensor arrangement for detecting radiation having a layer sequence which contains: a holding substrate (30) which is permeable to the detectable radiation, at least in regions, or produces the detectable radiation when radiation impinges thereon (See Abstract) and which holds a plurality of detection

elements (photosensitive elements) in the sensor arrangement (col. 2, lines 61-65 and col. 5, lines 12-18), at least one auxiliary layer (50) which is permeable to the detectable radiation and extends continuously over a set of the plurality of detection elements (col. 5, lines 61-63), a detector layer (32) which separate detection regions which are contained in a detection element and respectively contain at least one semiconductor component which is sensitive to the detectable radiation (col. 2, lines 65-68, col. 3, lines 1-3), and an insulating layer (34) which separates insulating regions for electrically insulating the detection region from a point of contact (col. 4, lines 41-47). Henry does not disclose of pads electrically connected to connecting points routed to the semiconductor components. Turnbull discloses infrared detection device comprising an insulating layer with separate insulating regions (259) for electrically insulating the detection regions from a point of contact (253) having electrically conductive connections (i.e. connecting bumps) and pads (254) being electrically connected to connecting points which are routed to the semiconductor component (See Fig. 8 and col. 11, lines 54-68 and col. 12, lines 1-11). Turnbull teaches the conductive substrate is divided by grooves into an array of conductive pillars to form individual connections between each detector element and the circuit. This provides a comparatively simple connection scheme. The array of conductive pillars is held together by insulating material at least at a part of the grooves so as to form a substrate unit which can be handled with the film mounted thereon, before mounting the substrate on the circuit (col. 11, lines 35-53). Therefore, it would have been obvious to modify the sensor

arrangement, disclosed by Henry, to include pads, as disclosed supra by Turnbull, to form a conductive substrate unit.

Regarding claim 2, Turnbull discloses wherein the holding substrate (255) contains regions which are permeable to the detectable radiation and are respectively contained in a detection element (21)(22) and holding substrate contains, between the detection elements regions which absorb or reflect (26) the detectable radiation (See Fig. 8 and col. 10, lines 37-41).

Regarding claim 3, Henry discloses sensor arrangement wherein the holding substrate contains a material which converts X-ray radiation into radiation which can be detected with a pin diode (col. 5, lines 52-63).

Regarding claim 5, Turnbull discloses wherein the insulating layer is a glass layer (col. 9, lines 59-62).

Regarding claim 6, although Henry does not specifically disclose of the numer of detection elements in the sensor arrangement, Henry does disclose the X-ray imaging device is a large-sized device with dimension of several tens of centimeters square, the glass' thickness is of several millimeters to illuminate the device through the upper surface rather than through the glass which would absorb a fraction of the radiation.

Regarding claim 7, Henry discloses the sensor arrangement wherein each of the semiconductor components contains a doped region (38)(40)(42) of one conduction type, a doped region of another conduction type and, between these doped regions, an intermediate region which is undoped or is provided with a weak doping as compared

with the doping of the other doped regions (See Fig. 2a and 2b and col. 1, lines 43-61 and col. 5, lines 3-24).

Regarding claim 16, Henry discloses the detection layer contains silicon (col. 4, lines 3-6).

Regarding claim 17, Henry discloses wherein the emitted radiation is X-ray radiation (See Abstract).

5. Claims 4 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Henry et al (US 4,940,901)* and *Turnbull et al (US 5,122,666),* as applied to claim 1 above, and further in view of *Harootian et al (US 6,252,231 B1)*

Regarding claim 4, Henry discloses a sensor arrangement for detecting radiation having a layer sequence which contains: a holding substrate (30) which is permeable to the detectable radiation, at least in regions, or produces the detectable radiation when radiation impinges thereon (See Abstract) and which holds a plurality of detection elements (photosensitive elements) in the sensor arrangement (col. 2, lines 61-65 and col. 5, lines 12-18), at least one auxiliary layer (50) which is permeable to the detectable radiation and extends continuously over a set of the plurality of detection elements (col. 5, lines 61-63), a detector layer (32) which separate detection regions which are contained in a detection element and respectively contain at least one semiconductor component which is sensitive to the detectable radiation (col. 2, lines 65-68, col. 3, lines 1-3), and an insulating layer (34) which separates insulating regions for electrically insulating the detection region from a point of contact (col. 4, lines 41-47). Turnbull discloses infrared detection device comprising an insulating layer with separate

insulating regions (259) for electrically insulating the detection regions from a point of contact (253) having electrically conductive connections (i.e. connecting bumps) and pads (254) being electrically connected to connecting points which are routed to the semiconductor component (See Fig. 8 and col. 11, lines 54-68 and col. 12, lines 1-11). Neither Henry nor Turnbull disclose of filling material. Harootian discloses an x-ray detector system for a CT scanner comprising filling material (i.e. epoxy resin) mixed with a material which absorbs or reflects the detectable radiation (col. 3, lines 11-21). Harootian teaches the spaces between adjacent scintillating crystals are preferably filled with a substantially light-reflective, x-ray absorbent medium. The medium is preferably a mixture of a substantially optically transparent curable vehicle, such as an epoxy, which is curable upon exposure to light or thermal energy, and tantalum pentoxide, which may be in the form of a white powdered solid. The mixture preferably comprises a white, highly reflective paste or slurry which can easily be applied by capillary flow or injection into the interstitial spaces between adjacent detector crystals. A significant advantage of tantalum pentoxide over either titanium dioxide or lead oxide, or both together, is that tantalum pentoxide is both highly light-reflective and highly x-ray absorbent, due to its relatively high density (8.2 grams/cm.sup.3). Moreover, because of its relatively high reflectivity and density, it can be used in relatively high concentrations, which need not be limited except to control the viscosity of the resulting mixture. Thus, an application of tantalum pentoxide can eliminate the requirement that both titanium dioxide and lead oxide be used, thus reducing manufacturing and labor costs (col. 3, lines 11-33). Therefore, it would have been obvious to modify the sensor

arrangement disclosed by Henry and Turnbull, to include a filling material, as disclosed supra by Tran, to allow for both a highly light-reflective and highly x-ray absorbent sensing radiation detector.

Regarding claim 14, Tran discloses wherein the filling material is an epoxy resin (col. 3, lines 13-16).

Regarding claim 15, Tran discloses wherein the filling material is mixed with titanium dioxide (col. 3, lines 13-17).

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Harootian et al (US 6,252,231 B1)* in view of *Turnbull et al (US 5,122,666).*

Regarding claim 8, Harootian discloses a computer tomography, comprising a radiation transmission unit for emitting radiation; a detection unit (10) for detecting the emitted radiation following passage of the emitted radiation through internal anatomical structures of a patient which influence a radiation intensity (col. 1, lines 5-11 and col. 61-67); and an evaluation unit (i.e. data acquisition system) which receives output signals from the detection unit as the basis for producing image data for an image of structure of the internal anatomical structures of a patient (col. 3, lines 1-10), wherein the detection unit contains a sensor arrangement, the sensor arrangement comprising: a holding substrate (16) which is permeable to the emitted radiation at least in regions, or produces detectable radiation when the emitted radiation impinges thereon and which holds a plurality of detection elements(14) in the sensor arrangement (col. 2, lines 61-67 and col. 3, lines 1-21), at least one auxiliary layer (12) which is permeable to the emitted or detectable radiation and extends continuously over a set of the plurality of

detection elements (14) (See Fig. 3 and col. 3, lines 1-13), a detection layer which separate detection regions which are contained in a detection element and respectively contain at least one semiconductor component which is sensitive to the emitted or detectable radiation (col. 4, lines 16-27). Harootian does not disclose an insulating layer. Turnbull discloses infrared detection device comprising an insulating layer with separate insulating regions (259) for electrically insulating the detection regions from a point of contact (253) having electrically conductive connections (i.e. connecting bumps) and pads (254) being electrically connected to connecting points which are routed to the semiconductor component (See Fig. 8 and col. 11, lines 54-68 and col. 12, lines 1-11). Turnbull teaches the conductive substrate is divided by grooves into an array of conductive pillars to form individual connections between each detector element and the circuit. This provides a comparatively simple connection scheme. The array of conductive pillars is held together by insulating material at least at a part of the grooves so as to form a substrate unit which can be handled with the film mounted thereon, before mounting the substrate on the circuit (col. 11, lines 35-53). Therefore, it would have been obvious to modify the sensor arrangement, disclosed by Harootian, to include pads, as disclosed supra by Turnbull, to form a conductive substrate unit.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Henry et al (US 4,940,901)* and *Turnbull et al (US 5,122,666),* as applied to claim 1 above, and further in view of *Tran et al (US 5,545,899 A)*

Regarding claim 13, Henry discloses a sensor arrangement for detecting radiation having a layer sequence which contains: a holding substrate (30) which is

permeable to the detectable radiation, at least in regions, or produces the detectable radiation when radiation impinges thereon (See Abstract) and which holds a plurality of detection elements (photosensitive elements) in the sensor arrangement (col. 2, lines 61-65 and col. 5, lines 12-18). Henry does not disclose of semiconductor material. Tran discloses a radiation detection panel comprising a substrate containing a highly absorbent semiconductor material GaO sulfide (col. 5, lines 56-62). Tran teaches the phosphor may consist of conventional phosphors or pre-structured phosphors, such as gadolinium oxide sulfide doped with terbium or europium or other phosphors known to those skilled in the art (col. 5, lines 56-62). Therefore, it would have been obvious to modify the sensor arrangement comprising a substrate of GaO sulfide or other phosphors known in the art, to allow for a more versatile radiation sensor.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Faye Boosalis whose telephone number is 571-272-2447. The examiner can normally be reached on Monday thru Friday from 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FB

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PRIMARY EXAMINER